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Federal Involvement in Flood Response and Flood Infrastructure Repair: Hurricane Sandy Recovery

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Summary

Hurricane Sandy was a reminder that the United States is vulnerable to significant weather hazards, and that infrequent but intense flood events can cause significant damage and disruption. In addition to wind damages and electricity disruptions, the storm's surge damaged property and infrastructure in coastal and inlet areas, while the storm's rains and snowmelt swelled rivers and creeks. These impacts contributed to public safety concerns and private and public property loss. Although the storm was not notable for its wind intensity, Sandy's significant size, its unusually low atmospheric pressure, and the astronomic high tide combined with other weather systems to amplify flooding consequences and economic and transportation disruptions. With events like Hurricane Sandy, common questions for Congress include: Which federal programs can assist with flood-fighting? Which federal programs can assist with repairing damaged dunes, levees, and other flood protection? What are the policy and funding issues that may arise during recovery?

While state and local entities have significant flood-related responsibilities, federal resources are called in as these entities are overwhelmed and as presidential disasters are declared. Several agencies, including the Federal Emergency Management Agency (FEMA) and the U.S. Army Corps of Engineers, have authorities to respond to flood emergencies and to assist with recovery efforts. FEMA has primary responsibilities for federal flood insurance, disaster assistance, and hazard mitigation programs. In addition to its floodfighting authorities, the Corps has a program to repair damaged levees, dams, berms, and other flood control works. Post-Sandy demand for such repairs is likely to be extensive.

For work performed under some of the Corps authorities, a near-term issue may be that Congress typically funds these actions using emergency supplementals. While current funding levels are not likely to interfere with emergency response activities, federal funds may become an issue in proceeding with post-disaster repair and recovery investments. After the emergency has passed and recovery has been initiated, local and federal decision makers will be faced with questions of how to rebuild and what types of flood protection investments to make. Federal policy makers will be faced with the recurring questions of whether current flood policies and projects are effective at reducing flood risk and are financially sustainable.

Hurricane Sandy in 2012, Midwest flooding in 2011 and 2008, Hurricane Ike in 2008, and Hurricanes Katrina and Rita in 2005 renewed congressional interest in the suite of tools available to improve flood resiliency. A challenge is how to structure federal actions and programs so they provide incentives to reduce flood risk without unduly infringing on private property rights or usurping local decision making. Tackling this challenge would require adjustments to flood insurance, disaster aid policies and practices, and programs for structural and nonstructural flood risk reduction measures and actions. In July 2012, the 112th Congress enacted, as part of MAP-21 (P.L. 112-141), an extension and some revisions of FEMA's National Flood Insurance Program through September 30, 2017. Otherwise, legislative action in recent years has done little to alter the broad federal approach to the nation's flood risk management.

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In late October 2012, Hurricane Sandy developed into a large weather system affecting both coastal and interior portions of the East Coast, including major population centers like New York City and smaller centers like Atlantic City, NJ. In addition to the wind damage and electricity disruptions to 8 million customers in the Northeast,[1] the storm's surge damaged public and private property and infrastructure in coastal and inlet areas, while the storm's precipitation swelled rivers and creeks. Although the storm was not notable for its wind intensity, the storm's significant size, its unusually low atmospheric pressure, and the astronomic high tide combined with other weather systems to amplify coastal, river, stream, and local flooding. This flooding disrupted transportation, business, and government operations and created public safety concerns that necessitated voluntary and emergency evacuations.

The Federal Emergency Management Agency (FEMA) has extensive authorities to assist with emergency actions and recovery efforts from hurricane and flood damage.[2] In implementing the federal response FEMA can assign missions to numerous other federal agencies. The U.S. Army Corps of Engineers (hereinafter referred to as the Corps) has been actively working on emergency engineering missions related to infrastructure using its power engineering and dewatering expertise. In addition to its FEMA assignments, the Corps has its own emergency response authority and a program to assist with repairs of eligible hurricane protection and flood control projects. While availability of funding is unlikely to interfere with near-term emergency response activities in the case of federal response and recovery programs without significant existing balances, federal funding for these programs may become an issue. This is the case for the Corps' flood and hurricane project repair program.

As recovery proceeds, Congress may be faced with questions about the efficacy of current federal approaches and participation in hurricane protection (and the relationship of these issues to mandatory flood insurance) and a reevaluation of how federal programs and policies influence coastal development. As decision makers evaluate options for how to manage the Atlantic Coast's coastal flood hazard, it is important to distinguish between the frequency of a storm with particular characteristics and the frequency of a storm surge height or other coastal flood hazard for a specific location. That is, while probability of another storm just like Sandy is unlikely, the likelihood of coastal communities seeing storm surges and flooding hazards like those experiences with Hurricane Sandy is much higher.

This report first provides a primer on federal flood policy. The remainder of the report describes the federal role in emergency flood response and post-disaster repair and rehabilitation of flood protection measures. This report will help answer the following questions: Which federal programs can assist with floodfighting? Which federal programs can assist with repairing damaged dunes, levees, and flood control works? What are the flood policy and funding issues that may arise during recovery from Hurricane Sandy?

[1] U.S. Department of Energy, *Hurricane Sandy Situation Report #4, October 30 2012 (10:00 AM EDT)*, Washington, DC, October 30, 2012, http://www.oe.netl.doe.gov/docs/2012_SitRep4_Sandy_10302012_1000AM.pdf. According to the situation report, 2.4 million customers in New Jersey, 1.9 million in New York, and 1.3 million in Pennsylvania had lost electricity as well as others in 14 additional states and the District of Columbia.

[2] See CRS Report R41981, *Congressional Primer on Major Disasters and Emergencies*, by Francis X. McCarthy and Jared T. Brown.

Federal Flood Policy: A Primer[3]

Shared Flood Responsibilities

In the United States, flood-related responsibilities are shared: local governments are responsible for land use and zoning decisions that shape floodplain and coastal development, while state and federal activities influence community and individual decisions on managing flood risk. State and local governments largely are responsible for making decisions (e.g., zoning decisions) that allow or prohibit development in flood-prone areas. Local and some state entities construct, operate, and maintain most flood control measures such as levees, floodwalls, coastal dunes, and seawalls.

Federal Role and Agencies

While local and state entities maintain primary flood responsibilities, the federal role is significant. The federal government constructs many levees, floodwalls, and coastal dunes in partnership with local project sponsors; local entities, however, are fully responsible for operation and maintenance. The federal government also supports hazard mitigation, offers flood and crop insurance, and provides emergency response and disaster aid for significant floods. Dams that can serve flood control purposes have a wider variation in their ownership and operational responsibilities, with the federal government having a primary role in many of the larger dams.

The principal federal agency involved in federal flood management investments and activities and flood-fighting is the U.S. Army Corps of Engineers. The Federal Emergency Management Agency (FEMA) has primary responsibilities for federal hazard mitigation,[4] the National Flood Insurance Program (NFIP),[5] and disaster assistance. In addition to the Corps floodfighting authorities, the Corps has a program to repair damaged levees, dams, berms, and other flood control works. Post-Sandy demand for such repairs is likely to be extensive. A near-term issue for actions under the Corps authorities is that their funding is often appropriated through emergency supplementals.

Other federal agencies also are involved with flood-related activities, such as the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), the Department of the Interior's Bureau of Reclamation, the Tennessee Valley Authority, and the International Boundary and Water Commission. Also, crop insurance and agricultural disaster assistance for flood damages is administered by the U.S. Department of Agriculture. Other agencies, such as the U.S. Geological Survey and the National Weather Service, provide data used in assessing flood risk.

Status of Federal Flood Policy

Since Hurricane Katrina in 2005 and compounded by concerns over the federal debt, interest has increased in reducing the federal flood response's reliance on emergency supplementals, reevaluating the roles and divisions of flood responsibilities, addressing gaps in investments and poorly addressed flood risk, and improving the incentives influencing decisions in flood-prone

[3] For a list of CRS flood experts, see CRS Report R40882, *Flooding Events: CRS Experts*, by Amy Abel. For a list of CRS hurricane experts, see CRS Report R40881, *Hurricane Events: CRS Experts*, by Nicole T. Carter.

[4] For more on FEMA's flood hazard mitigation activities, see CRS Report R40471, *FEMA's Hazard Mitigation Grant Program: Overview and Issues*, by Natalie Keegan.

[5] CRS Report R40650, *National Flood Insurance Program: Background, Challenges, and Financial Status*, by Rawle O. King.

areas. In July 2012, the 112th Congress enacted, as part of MAP-21 (P.L. 112-141), an extension and a number of modifications to FEMA's National Flood Insurance Program through September 30, 2017.[6] Beyond the NFIP reauthorization, Congress has changed little in the federal flood policies and programs since 2005.

Flood Risk

Hurricane Sandy was a reminder that, although forecasting and emergency response have improved over time and investments have been made in flood and hurricane risk reduction measures, significant flood risk remains. Significant storms can cause flooding in areas that are outside the 100-year floodplain (i.e., the area with a 1% probability of flooding annually) or cause storm surges that have a low probability of occurring but cause extensive damages. Significant storms can produce flooding that exceeds the ability of levees, floodwalls, seawalls, and dunes to protect the lives and investments behind them.

Hurricane Sandy, like Hurricane Katrina, demonstrated that not only property damage but also significant risks to life, economic disruption, and other social hardships occur during floodwaters and storm surge. Flood risk is a composite of three factors:

- *threat* of an event (e.g., probability of a 10-foot storm surge in New York City);
- *vulnerability*, which allows a threat to cause consequences (e.g., level of protection provided by levees and dams, their reliability, and location within a floodplain or on a coast);
- *consequence* of an event (e.g., property damage, loss of life, economic loss, environmental damage, reduced health and safety, and social disruption).

Generally, flood risk grows with more development and population in flood-prone areas.[7] A range of options are available for reducing this risk, but some level of flood risk will always remain. Ex-post analysis of Hurricane Sandy will help inform understanding of how the storm's surge and flood hazard compared to previous storms and how they compare to models of future conditions, including under climate change scenarios.[8] Significant debate continues about whether hurricane threats to the United States are changing; treatment of this topic is beyond the scope of this report.

[6] Notably absent from the reauthorization was mandatory flood purchase requirements for areas of residual risk—those areas that are protected by flood control measures (e.g., levees, dunes) but face flood risk if these measures are overwhelmed or fail. The NFIP does not differentiate between 100-year flood protection provided by a flood control structure and flood protection resulting from natural topography and hydrology. Development behind levees and downstream of dams providing 100-year flood protection is not designated as being in a "special flood hazard area," thus freeing occupants from flood insurance requirements. This approach largely presumes that levees, dams, and other flood control structures will not fail, when their presence does not entirely eliminate an area's vulnerability to flooding.

[7] The principal causes of floods in eastern states and the Gulf Coast are hurricanes and storms. Coastal counties are 17% of the land area, and home to roughly 50% of the country's population and jobs. Flooding in the Midwest and western states is primarily from snowmelt and rainstorms. At least 9 million homes and $390 billion in property are at risk from a flood with a 1% annual probability of occurring. These estimates are a lower bound from the January 1997 FEMA report, *FEMA's Multi-Hazard Identification and Risk Assessment (MHIRA)*, available at http://www.fema.gov/library/viewRecord.do?id=2214. The magnitude of flood events traditionally has been measured by recurrence intervals, or the likelihood of a flood of a particular size occurring during any 10-, 50-, 100-, or 500-year period. Respectively, these events have a 10%, 2%, 1%, and 0.2% chance of being equaled or exceeded during any year.

[8] Some analyses that are likely to inform understanding of the frequency of storm surges like those seen with Hurricane Sandy were already underway. Prior to Hurricane Sandy, FEMA was preparing assessments of the storm surge and wave threat to New York City as part of a larger effort covering 19 coastal counties in New York and New Jersey and 9 counties in the Hudson River valley. This was part of the agency's efforts to utilize improved data (e.g., LIDAR data) and modeling for producing the maps that support the NFIP. New maps for the area were anticipated for May 2013; the

Flood Insurance and Low-Probability Flood Events

U.S. federal flood policies and programs are structured around managing the impacts of the more common flood events, and often are challenged by low-probability (or even medium-probability) but high-consequence events. In the United States, the 1% annual chance flood, more commonly known as the 100-year flood or storm surge, is a standard often used as a basis for identifying, mapping, and managing flood hazards. For example, the National Flood Insurance Program (NFIP) and most state and local governments use location in the 100-year floodplain or similar coastal zone inundation areas as triggers for various requirements. The adoption of the 100-year flood standard in many respects guides perceptions of what is an acceptable level of vulnerability. The 100-year flood standard is a vulnerability standard, and not a risk standard. Thus, the question of whether the 100-year flood standard combined with current threat and consequence information results in an acceptable level of risk remains largely unaddressed. This question is especially relevant for low-probability, high-consequence events such as those hitting a major urban center.

The attempt to provide at least 100-year flood protection often drives local floodplain management and infrastructure investments, resulting in a measure of equity within and across communities. That equity in vulnerability, however, results in uneven levels of risk, because flooding of different communities has different consequences, such as differences in the potential loss of life, social disruption, structures damaged, and economic impact due to variations in land use and development patterns.

Flood Control Projects: Federal Emergency and Post-Disaster Roles and Activities

Responsibilities Shared Between Federal Agencies

The two principle agencies involved in flood control projects, repair of those projects, and flood fighting are FEMA and the Corps, as shown in **Table 1**. The Corps performs considerable flood control construction and damage repair. In contrast, FEMA's role in flood control projects is more limited, but its role is significantly broader in coordinating overall federal activities that assist states, communities and individuals with emergency flood response and recovery.

Table 1. FEMA and Corps Authorities for Locally Operated Flood Damage Reduction Projects

Federal Agency	Study and Construction	Operation & Maintenance	Emergency Flood Fighting	Repair of Damage	Improvements
FEMA	Authority unclear[a]	No authority	Stafford Act (42 U.S.C. 5170a)	Stafford Act, but limited to activities not covered by programs of other federal agencies[a]	Authority unclear[a]

assessment's approach is described in FEMA Region II, *Introduction to Risk Map NYC Coastal Study*, October 18, 2012, https://www.rampp-team.com/documents/newyork/Intro_to_NYC_Coastal_Study_10-18-2012.pdf. The assessment is using past storms to model the present and future storm surge threat (FEMA, *Redefinition of the Coastal Flood Hazard Zones in FEMA Region II: Analysis of the coastal Storm Surge Flood Frequencies: Summary and Background of Restudy*, August 2011, Redefinition of the Coastal Flood Hazard).

Federal Agency	Study and Construction	Operation & Maintenance	Emergency Flood Fighting	Repair of Damage	Improvements
Corps	Congressionally authorized actions	No authority	Emergency response authority (33 U.S.C. 701n)	Rehabilitation and Inspection Program (33 U.S.C. 701n)	No authority

Source: Adapted from CRS Report R41752, *Locally Operated Levees: Issues and Federal Programs*, by Natalie Keegan et al.

a. 42 U.S.C. 4104c provides FEMA with the authority to undertake flood mitigation activities. It is unclear to what extent such authority would extend to locally operated levees within the regulatory constraints of the prohibition on duplication of federal programs, including Corps and Natural Resources Conservation Service programs.

FEMA: Emergency Flood Fighting

The Stafford Act (42 U.S.C. 5170b) authorizes FEMA to direct the Department of the Defense (including the Corps) and other federal agencies to use its resources to provide assistance in the event of a major disaster or emergency declaration by the President.[9] When a disaster occurs and a state is granted federal disaster assistance under the Stafford Act, funding under the Public Assistance program may be available to reimburse communities for flood-fighting activities and emergency repairs made to eligible infrastructure.[10] Generally, Public Assistance program funds are limited to restoring a structure to its pre-disaster condition; projects to construct new flood control measures or enhance existing measures are not eligible. Because of Hurricane Sandy's significant damage to hurricane protection projects that use dunes and other sand-based measures and other types of beach damage and shore erosion, FEMA's policies regarding which activities are eligible for some types of disaster and recovery assistance is receiving particular attention.[11]

Corps: Flood Control and Coastal Emergencies Authorities

In P.L. 84-99 (33 U.S.C. §701n), Congress gave the Corps emergency response authority that allows the agency to fight floods and other natural disasters. In this same law, Congress also gave the Corps the authority for a program to repair damaged flood control works. Both of these activities are discussed below in more detail. Limited appropriations for these Corps activities generally are included in the annual Energy and Water Development appropriations acts as part of the agency's civil works budget (e.g., $0 in FY2011 appropriations, $27 million in FY2012 appropriations) in the Corps' Flood Control and Coastal Emergencies (FCCE) account. Congress generally appropriates the majority of FCCE funds through emergency supplemental appropriations, ranging from significant funding following Katrina to no funds in some years. In the last decade, these activities have received $12 billion; the vast majority of these funds went to congressionally directed work on reengineering and reconfiguration of Hurricane Katrina-damaged floodwalls and levees in Southeast Louisiana.

[9] For more on FEMA disaster assistance broadly, see CRS Report RL33053, *Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding*, by Francis X. McCarthy.

[10] 42 U.S.C. §5172(b). For a description of the eligible types of infrastructure, see CRS Report R41752, *Locally Operated Levees: Issues and Federal Programs*, by Natalie Keegan et al.

[11] FEMA, Disaster Assistance Fact Sheet DAP9580.8, Eligible Sand Replacement on Public Beaches, October 1, 2009, http://www.fema.gov/pdf/government/grant/pa/9580_8.pdf.

After flood disasters, it is often not only the Corps' FCCE account that receives supplemental funding; Congress also has appropriated funds for the agency's construction and operations and maintenance accounts to construct new works (e.g., new levee projects) or repair other works (e.g., navigation channels) after major flood disasters. In total, the Corps has received roughly $25 billion in supplemental funding since 2001. The reliance on significant supplemental funding for Corps work is raising questions about alternative ways to fund these activities and whether there are opportunities through the annual appropriations process.

Emergency Response

As previously noted, Congress gave the Corps specific emergency flood authorities in P.L. 84-99. Congress authorized the Corps to conduct disaster preparedness, advance measures, and emergency operations (disaster response and post-flood response), emergency dredging, and flood-related rescue operations. These activities are limited to actions to save lives and protect improved property (i.e., public facilities and services, and residential or commercial developments). Congress has also authorized the Corps to provide this emergency response assistance for up to 10 days following an emergency and before a presidential declaration of an emergency.

Repair of Flood Control Projects

The Corps is the principal agency that assists with repairs to damaged flood control works, like dams, levees, and dunes. These repair and rehabilitation activities are undertaken after the peak of a flood event has occurred and the extent of damage from the flood event can be determined.

Funding for Repairs

Through its Rehabilitation and Inspection Program (RIP), the Corps provides for rehabilitation of damage to flood control projects and federally constructed hurricane or shore protection projects and related inspections. The program's repair of damaged facilities following large flood events has historically been funded largely through emergency supplementals. For smaller RIP repairs, the Corps often attempts to fund repairs within its existing funding. For example, in December 2011, the program received $388 million for repairs mainly associated with 2011 Midwest flooding as part of the Disaster Relief Appropriations Act, 2012 (P.L. 112-77), and in 2008, the program received $740 million largely for repairs in response to Midwest flooding through the Supplemental Appropriations Act, 2008 (P.L. 110-252). At times, some eligible repairs have been delayed due to limitations on the availability of funds.

Eligibility and Cost-Share for Repairs

To be eligible for rehabilitation assistance, the flood control project must be in active status with the RIP program at the time of the damage by wind, wave, or water action that is beyond ordinary.[12] The following types of works are eligible for inclusion in RIP:

[12] 33 U.S.C. 701n. For more information on RIP, see USACE, Engineer Regulation 500-1-1, *Emergency Employment of Army and Other Resources Civil Emergency Management Program*, available at http://140.194.76.129/publications/eng-regs/. Eligibility is also limited to locally constructed and maintained levees and floodwalls that provide either a minimum of a 10-year level of flood protection, or a minimum of a five-year level of protection to an agricultural area. Local levee owners request that the Corps consider their levee to be included in the RIP. To keep an active RIP status, the nonfederal entity is required to maintain the project properly, such as controlling encroachments into the foundation, and managing vegetation and erosion. The sufficiency of the maintenance is determined during an annual or semi-annual inspection by the Corps, with the nonfederal entity taking actions to address any identified deficiencies.

- non-federally or federally constructed, locally maintained levees and floodwalls; and
- federally authorized and constructed hurricane and shore protective measures (e.g., dunes, berms, and sacrificial beaches).

For locally constructed projects, the cost to repair the damage is paid 80% by the Corps and 20% by the nonfederal entity. For federally constructed projects, the repair cost is entirely a federal responsibility (except for the costs of obtaining the sand or other material used in the repair). Many of the hurricane protection projects damage by Hurricane Sandy were federally constructed.

For RIP assistance, the repair must have a favorable benefit-cost ratio; this calculation does not include recreation benefits, which may be significant for some coastal projects. Rehabilitation assistance is limited to repair or restoration of the project to its pre-disaster level of protection; no betterments or levee setbacks are allowed. Nonfederal entities are required to assume any rehabilitation cost of damage to an active project that is attributable to deficient maintenance. For hurricane storm damage reduction projects, actions eligible for RIP must address an issue critical to the functioning of the project. Depending on the condition of the measure and the timing, nourishment may be planned for immediately as part of a RIP effort or it may occur later as part of the regular nourishment of the project.

Improvements Beyond Repairs

A common issue that arises under RIP (as well as for FEMA mitigation programs discussed later) is interest in not only repairing levees but also improving them. Congress expressly restricted RIP funds to repair. The program is not designed to evaluate the federal interest in investments to further reduce the flood risk at a location.

If federal participation is sought to increase protection, the typical route would be to pursue a study by the Corps to initiate a separate flood damage reduction project. Historically, Congress often has authorized Corps studies and at times construction projects for flood-damaged communities soon after significant storms; at times, these authorizations have been included in appropriations bills. Standard procedure, however, is for Congress to authorize Corps studies in a resolution of the authorizing committee or a Water Resources Development Act (WRDA). Since 2010, congressional action on committee resolutions for Corps studies, WRDA bills, and Corps appropriations have been complicated by earmark moratoriums.[13]

Coastal Protection and Development Debate

Many coastal communities affected by Hurricane Sandy in Delaware, Maryland, New Jersey, and New York received assistance in reducing their vulnerability to coastal storms through federal investments in Corps hurricane protection projects. Many of these projects use sand dunes, berms, and beaches to reduce storm surge damage, and for the Corps to regularly replenish the sand in order to maintain the protective works. Post-Sandy assessments of the funding needs to repair these projects and how well each project performed are not yet available. Preliminary indications are that a number of the projects performed well; others may have been overwhelmed by the storm's surge and floodwater; and others may have performed below their designs.

Sand- and beach-based hurricane protection projects have received some critical attention in recent years, which may complicate the congressional debate around repair of the existing projects and authorization of similar projects. Some taxpayer advocates oppose further federal funding for these projects; they argue that the

[13] CRS Report R41243, *Army Corps of Engineers Water Resource Projects: Authorization and Appropriations*, by Nicole T. Carter and Charles V. Stern.

protection benefits are temporary and poorly documented, and that the primary beneficiaries often are private property owners and recreational interests. Annual federal funding for these activities have totaled to roughly $900 million for the last decade. This has made federal beach nourishment subject to proposed cuts. Other stakeholders are concerned that these projects increase the risk to lives and property and decrease participation in flood insurance programs; that is, because of protection against more frequent storms, communities behind these projects intensify development and underestimate their risk.

Supporters of sand- and beach-based protection efforts counter that these projects have undergone the same benefit-cost analyses as other Corps projects to justify the federal investment, that these projects protect existing communities and infrastructure, and that recent projects have performed technically well when assessed after storms in 2004. Other countries, such as the Netherlands, also use coastal dunes and sand placement to provide protection; however, these measures are generally employed for less populated areas and are exposed to less intense storms than many U.S. coastal reaches.

A systematic and independent analysis of actual life-cycle expenditures and benefits of these coastal hurricane protection and flood damage reduction projects has not been performed. Consequently, decision makers have little authoritative information based on historic performance with which to analyze the fiscal payoff of future federal investments in different types of coastal protection measures. Hurricane Sandy may provide a particularly useful opportunity to evaluate how well different types and designs for coastal protection projects performed. It also may represent an opportunity to assess how well policies (e.g., Corps requirements for land use plans for nonfederal project sponsors) and investments in different locations are managing coastal flood risks.

Sources: National Commission on Fiscal Responsibility and Reform, *Co-Chairs' Proposal: 200 Billion in Illustrative Savings*, Washington, DC, November 12, 2010; Office of Senator Tom Coburn, *Washed Out to Sea: How Congress Prioritizes Beach Pork Over National Needs*, Congressional Oversight & Investigation Report, Washington, DC, May 2009; Taxpayers for Common Sense, *Sliding Past Sequestration: Two Trillion in Common Sense Cuts to Avoid the Fiscal Cliff*, Washington, DC, October 2012; American Shore & Beach Preservation Association, *How Beach Nourishment Projects Work*, Washington, DC, 2007.

Beyond Sandy: Flood Policy Challenge

Developing and investing in flood-prone areas represents a tradeoff between the location's economic and other benefits and the exposure to a flood hazard. Hurricane Sandy in 2012, Midwest flooding in 2011 and 2008, Hurricane Ike in 2008, and Hurricanes Katrina and Rita renewed interest in the suite of tools available to improve flood resiliency. In addition to oversight and funding of emergency response activities, at issue for Congress is deciding on whether and how to enact and implement feasible and affordable flood policies and programs to reduce flood risk. The challenge is how to structure federal actions and programs so they provide incentives to reduce flood risk without unduly infringing on private property rights or usurping local decision making. Tackling this challenge would require adjustments in the flood insurance program, disaster aid policies and practices, and programs for structural and nonstructural flood risk reduction measures and actions.

Sandy-Damaged Private Properties: What's Next?

During recovery from Hurricane Sandy, there are likely to be three primary types of damaged private properties:

- **Flooded properties with flood insurance.** Generally, properties with government-backed mortgages located within the area expected to be inundated during a 1% probability flood (often referred to as the100-year floodplain) are required to purchase a National Flood Insurance Program (NFIP) policy.
- **Flooded properties without insurance that are mapped as being protected from the 1% probability flood due to hurricane protection works and flood control structures.** This second set of properties was the subject of congressional debate earlier in 2012. These residual-risk properties would have been subject to mandatory flood insurance purchase requirements if a provision of the NFIP reauthorization bill as reported in the Senate (§107 of S. 1940) had been included in the NFIP reauthorization bill enacted as part of MAP-21 (P.L. 112-141) in July 2012. The provision, however, was unlikely to have been in force at the time of Hurricane Sandy because implementation was contingent on completion of a national residual-risk mapping effort.
- **Flooded properties without insurance because mapped as outside the 1% probability flood due to geography and hydrology** (i.e., without the help of flood control structures).

The availability of limited federal assistance or loans to repair flood damage to uninsured properties depends on the specifics of the presidential disaster declaration for the area. Hurricane Sandy may change some stakeholders' views of the benefits of flood insurance and the policy debate about addressing residual risk if a significant number of damaged properties receive no or little federal assistance. These positions also may be shaped by perceptions of the probability of future storms producing similar flooding.

For more information on residual risk and the NFIP, see CRS Report R41056, *Mandatory Flood Insurance Purchase in Remapped Residual Risk Areas Behind Levees*, by Rawle O. King. For more information on disaster declaration and assistance, see CRS Report RL33053, *Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding*, by Francis X. McCarthy.

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